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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/873,087 | 06/01/2001 | Ilya Feygin | 301.0015 | 3734 |

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| EXAMINER | |
|---|---|
| GORDON, BRIAN R | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1743 | |

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/873,087 | FEYGIN, ILYA | |
| | Examiner | Art Unit | |
| | Brian R. Gordon | 1743 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *11 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *28-30 and 36-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *29,30 and 41-50* is/are allowed.

6)☒ Claim(s) *28 and 36-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments, see pages 7-8, filed July 24, 2003, with respect to the 112, second paragraph rejections of claims 36-50 have been fully considered and are persuasive. The 112, second paragraph rejection of claims 36-50 has been withdrawn.

2. Applicant's arguments, see page 8, filed July 24, 2003, with respect to the 102 rejection of claims 41-50 have been fully considered and are persuasive. The 102 rejection of claims 41-50 has been withdrawn.

3. Applicant's arguments filed July 24, 2003 have been fully considered but they are not persuasive. Applicant's arguments state that the gas dome B of Spence et al. (which the examiner asserts is structurally equivalent to applicants "flow interruption device") is merely a potential energy storage device. While Spence et al. has elected to refer to the device as a potential energy storing device the examiner hereby asserts that the device is structurally equivalent to the flow interruption device as claimed by applicant. The device has a separate inlet separate from the outlet. The device further comprises valves that allows for the interruption of fluid flow into and out of the dome and U-shaped tubing (u-valve). As such the previous rejection given in Paper 7, is hereby maintained.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 28 and 36-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Spence et al., US 3,167,395.

Spence et al. disclose a tubular reactor system useful for carrying out polymerization reactions requiring agitation of the reactants with slow mass transfer of the reactants through the system. As seen in figure 1, the tubular reactor is in the form of repetitive U-shaped system.

Vigorous agitation of the reactant mass minimizes or prevents this local accumulation of polymeric particles on smooth surfaces, and it is one object of the invention to accomplish this agitation in a tubular reactor having smooth interior walls without baffles or obstructions, and in which throughput flow is progressive. This is done in the invention by providing a tubular reactor equipped with energy storage devices (A and B) for imparting to the liquid contents of the reactor, an oscillatory motion at the frequency for resonance of the system, said resonance frequency being a function of the liquid reactant mass, the pipe cross sectional area, and the mechanical compliance of the energy storage devices. The oscillatory motion is sustained by an oscillatory flow generator operating at the said resonant frequency and having sufficient power to maintain the system in a condition of resonant oscillation.

A further object of the invention, to maintain a continuous output, of product from the reactor by the imposition of a throughput flow on the oscillatory motion of the resonating system. One embodiment of the invention comprises a tubular reactor having energy storage devices, such as gas domes, respectively located at respective

ends thereof, a pulse generating device, such as a piston or diaphragm pump connected in a parallel relationship between the reactor tube ends, and metering pumps for feeding reactants and removing products.

A gas delivery conduit G, leading from a source of gas supply, is adapted to deliver an inert gas (e.g., nitrogen) or air to the upper ends of the respective gas domes A and B. This gas delivery conduit G is provided with an intake valve 15 and control or shut-off valves 16 and 17 in the respective branches thereof leading to the respective gas domes A (reaction vessel) and B (flow interruption device). The gas dome A, is provided with a liquid level sight glass 81, including control valves 31 and 32, and an upper vent valve 33, and a lower drain valve 34. Similarly the vent valve 29 and lower drain valve 30. Each gas dome A and B is also provided with a pressure indicating gage 36.

In operation the potential energy storing gas domes A and B are supplied with their quotas of gas content. To this end, valves 3, 10, 11, 16, 17, 27, 28, 31 and 32 are opened, and valves 1, 2, 4, 5, 6, 7 8, 9, 12, 13, 14, 15, 18, 19, 20, 21, 29, 30, 33, 34, and 35 are closed. Valve 15 is opened to supply gas at approximately 50 psig. to the gas domes A and B from a source of supply, whereupon said valve 15 is closed and valves 4 and 5 are opened. Valve 2 is now again opened to further introduce start-up liquid into the syst6m until the gas domes A and B are each approximately half-filled therewith, as can be determined by inspection of the sight glasses SI and S2, whereupon valve 2 is closed against further entrance of start-up liquid.

Although the reaction vessel is not positively claimed, the gas dome A, of Spencer may be considered an equivalent and the gas dome B the equivalent of the flow interruption device with a sealed chamber with an inlet and outlet. As seen in Figure 1, both the inlet and outlet of the gas dome B are connected to the U-shaped tubing and the tubing in connection with the gas dome A having an inlet and outlet.

The device allows for monitoring and adjusting the level of liquid in both domes, allows for agitation, and purging of the system.

***Allowable Subject Matter***

3. Claims 29-30 and 41-50 are allowed.

4. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach nor fairly suggest the devices of claims 29-30: a chemical synthesis reaction tool, comprising a reaction vessel; a reaction vessel support disposed to hold the reaction vessel in a preferred orientation, an injection port, including a pressure seal, situated to provide access to said reaction vessel for the injection of liquids into said reaction vessel; an evacuation port, including a pressure seal, situated to provide access to said reaction vessel for the evacuation of fluids from said reaction vessel; injection and evacuation fittings formed to matingly engage said respective injection and evacuation ports and to thereby enable the delivery of fluids to the reaction vessel and the evacuation of fluids form said reaction vessel; a U-valve formed of flexible tubing and connected to regulate the flow of liquids from said evacuation through fitting; a flow-interruption device within the U-valve, the flow interruption device comprising: a sealed chamber; an inlet connected to a portion of

the U-valve connected to the discharge port of the vessel, the inlet allowing entry of liquid into the chamber; and an outlet connected to a section of the U-valve adapted to allow discharge of the liquid, the outlet being separate from the inlet in order to interrupt flow of liquid entering the chamber from flow of liquid exiting the chamber.

***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is (703) 305-0399. The examiner can normally be reached on M-F, with 2nd and 4th F off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 703-308-4037. The fax phone numbers for

the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

brg
September 29, 2003

Jill Warden
Supervisory Patent Examiner
Technology Center 1700